THE ROLE OF RAILROADS IN HAULING FARM PRODUCTS

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ABSTRACT: Shipments of agricultural products by rail have increased moderately most years since 1954. However, the increases have been primarily in semiperishable products, such as grains. Shipments of most perishables have declined. Revenues from farm products tended to decline over the 1954-69 period. In 1969, revenues from farm products were 87 percent of the 1954 level while tonnages were 107 percent. Lower rates for most agricultural products and the loss of considerable perishable products traffic account for the drop in revenues.
KEY WORDS: Transportation, railroads, perishable and semiperishable farm products.

The marketing of agricultural products continues to exert considerable demand for transportation services. Farm production was 31 percent greater in 1969 than in 1954. In addition, there were changes in the location of agricultural production such as the shifting of a considerable amount of livestock feeding and poultry production from the major feed grain producing areas to other regions. The shifts of the meatpacking industry from large cities to the livestock producing areas affected the demand for transportation. These and other shifts in economic activity and changes in the competitive structure and behavior of the different transportation modes resulted in significant changes in the shares of the various modes of farm product traffic.

Total Intercity Freight Traffic

The movement of unprocessed agricultural products by motor trucks and of bulk agricultural products by barges is not subject to regulation by the Interstate Commerce Commission (ICC) in most cases. Many States also permit trucks to haul agricultural products with little or no economic regulation. Therefore, adequate statistics on these movements are not available for comparison with those for rail. However, estimates of the total ton-miles of intercity freight by each mode are available from the ICC (table 5).

From 1946 to 1969 total ton-miles of intercity freight more than doubled. Railroads increased their traffic by only 30 percent while traffic by motor trucks nearly quadrupled. Inland water carriers and pipelines had growths of 144 and 328 percent, respectively, during this period. Airlines increased by 3341 percent, but their ton-miles of traffic in 1969 still was minor when compared with the other modes.

There was a steady decline in the share of intercity ton-miles of traffic hauled by railroads. In 1946 rail accounted for two-thirds of total traffic but the proportion had declined to 41 percent in 1969. Motor trucks increased their share from 9 percent to 21 percent. The inland water carriers' share increased from 14 percent to 16 percent, and pipelines increased from 11 percent to 22 percent. Airlines accounted for less than 0.2 percent of total traffic in 1969.

1/ This article updates a similar article published in the Marketing and Transportation Situation, November 1963.

Rail traffic has increased considerably since 1961. However, railroads have not shared in the increase in traffic at the same rate as other modes. Thus, while benefiting from the increased demand for transportation services, railroads have not been successful in maintaining their relative share of freight traffic.

Agriculture as a User of Rail Service

Unprocessed farm products are an important part of railroad's traffic. Between 1954 and 1969 shipments of unprocessed farm products by rail averaged 123 million tons per year or 9 percent of total carload freight traffic (table 6).

Table 5.--Estimated ton-miles of intercity freight traffic, public and private, by transport mode, 1946-69

Year	Railroads	Motor trucks	Inland water carriers	Pipe lines	Air lines	Total 1/
	Billions					
1946	602	82	124	96	.093	904
1947	665	102	147	105	.158	1019
1948	647	116	162	120	.223	1045
1949	535	127	139	115	.235	916
1950	597	173	163	129	.318	1063
1951	655	188	182	152	.379	1178
1952	623	195	168	158	.415	1144
1953	614	217	202	170	.413	1204
1954	557	213	174	179	.397	1123
1955	631	223	217	203	.481	1275
1956	656	249	220	230	.563	1355
1957	626	254	232	223	.572	1335
1958	559	256	189	211	.579	1215
1959	582	279	197	227	.739	1286
1960	579	285	220	229	.778	1314
1961	570	296	210	233	.895	1310
1962	600	309	223	238	1.289	1371
1963	629	336	234	253	1.296	1454
1964	666	356	250	269	1.504	1543
1965	709	359	262	306	1.910	1639
1966	751	381	281	333	2.252	1747
1967	731	389	283	361	2.592	1765
1968	757	396	291	391	2.900	1839
1969 *	780	404	302	411	3.200	1900

1/ Totals do not always add because of rounding.
Source: Annual reports of the Interstate Commerce Commission.
*Preliminary.

Table 6.--Rail freight tonnage, farm output and industrial production, 1954-69

Year	Farm product traffic 1/		Farm output 2/	All carload traffic except farm products 3/		Industrial production 4/
	1,000 tons	Index 1967=100	Index 1967=100	1,000 tons	Index 1967=100	Index 1967=100
1954	110,971	90	79	1,106,034	86	54
1955	112,692	92	81	1,276,654	99	61
1956	116,504	95	82	1,324,433	103	63
1957	115,014	94	81	1,259,870	98	63
1958	123,218	100	86	1,062,733	83	59
1959	120,304	98	87	1,107,974	86	67
1960	124,205	101	90	1,113,235	87	69
1961	126,572	103	91	1,064,582	83	70
1962	127,103	103	92	1,104,312	86	75
1963	131,027	107	95	1,152,142	90	78
1964	131,432	107	94	1,221,685	95	84
1965	130,476	106	97	1,255,614	98	91
1966	144,586	118	96	1,303,266	102	99
1967	123,008	100	100	1,283,660	100	100
1968	115,965	94	102	1,314,476	102	105
1969	119,291	97	103	1,353,329	105	109

1/ Freight Commodity Statistics, Class I Railroads in the United States, Interstate Commerce Commission. Includes only those products listed under "Farm Products."

2/ Gross production of livestock and crops.

3/ Freight Commodity Statistics, Class I Railroads in the United States, Interstate Commerce Commission. Includes all carload traffic except "Farm Products."

4/ Federal Reserve Board index of quantity output.

These products generated a yearly average of $1 billion in revenues for railroads, or 11 percent of railroad's total revenue from carload traffic (table 7). These figures do not include processed farm products such as animal feeds and other mill products, or canned and frozen foods, meats and other processed foods. These products averaged 90 million tons per year. Also substantial tonnages of farm machinery, fertilizer and other farm supplies add to agriculture's total demand for transportation.

Farm products 2/ have been a fairly steady source of traffic for railroads. During periods of decline in nonfarm shipments, the level of agricultural shipments has been maintained or increased. During 1960-62 nonfarm shipments averaged 85 percent of the 1967 level, while agricultural shipments averaged 102 percent of the 1967 level. This indicates that agricultural shipments have, to some degree, offset declines in nonfarm shipments.

Trends in rail revenues indicate that farm products are declining in importance as a source of revenue. Farm products accounted for 13 percent of total freight revenue in 1954, but declined to 10 percent in 1967 and 8 percent in 1969. These figures are indicative of a change in the quantities of different products hauled as well as substantial adjustments in rates for various commodities.

Shipments of farm products by rail have increased moderately most years since 1954. The trend in farm product traffic maintained a close relationship to farm output until 1965 (figure 1). Then the volume of grain hauled by railroads began to vary widely. In contrast there was considerable variation in the shipment of nonfarm products by railroads during 1954-69. There was a moderate increase in nonfarm traffic since 1961, but it compared poorly with the increase in industrial production (table 6).

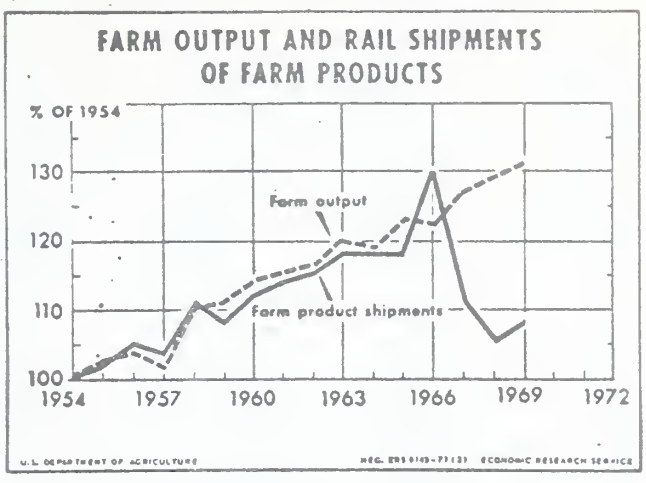

Figure 1

Rail Traffic in Semiperishable Farm Products

Between 1954 and 1969 railroads did quite well in competing for traffic in specific types of farm products, particularly bulky semiperishable commodities. Since 1954, 10 classes of semiperishable farm products, including grains, soybeans, sugarbeets, cotton, dry seeds and tobacco, accounted for an average of 8 percent of all rail traffic and 7 percent of all rail freight revenue (tables 8 and 9).

Grains have consistently made up a large part of farm product shipments by rail, accounting for 6 percent of all rail traffic during the 16-year period. Shipments of these products were 65 million tons in 1954, 101 million tons in 1966, and 78 million tons in 1969. The other 5 classes of semiperishable products also moved in considerable volume. About 20 million tons of these products went by rail in 1954, and 27 million tons in 1969.

From 1954 to 1969, rail shipments of 7 commodity classes increased in volume and 3 declined. Cotton decreased by 14 percent, oats by 31 percent, and tobacco

2/ Further reference to farm or agricultural products will be restricted to unprocessed products.

Table 7.--Rail freight revenue, cash receipts from farm marketings and gross national product 1954-69

Year	Revenue from farm products		Cash receipts from farm marketing	Revenue from all carload traffic, except farm products		Gross national product
	1,000 Dollars	Index 1967=100	Index 1967=100	1,000 Dollars	Index 1967=100	Index 1967=100
1954	1,043,395	115	70	6,846,893	80	46
1955	1,026,909	113	69	7,630,567	89	50
1956	1,074,188	119	71	8,030,722	94	53
1957	1,076,845	119	70	8,042,822	94	56
1958	1,135,172	125	78	7,122,023	83	56
1959	1,067,923	118	78	7,452,138	87	61
1960	1,030,980	114	80	7,217,815	84	63
1961	1,002,256	111	82	6,986,612	81	66
1962	991,550	109	85	7,293,730	85	71
1963	1,010,448	111	88	7,474,150	86	74
1964	973,729	107	87	7,873,087	92	80
1965	936,390	103	92	8,288,747	97	86
1966	1,039,253	115	101	8,640,071	101	95
1967	906,484	100	100	8,585,626	100	100
1968	851,560	94	104	9,323,245	109	109
1969	908,251	100	106	9,892,890	115	117*

*Preliminary

by 54 percent. In contrast, shipments of sorghum grain and soybeans about doubled.

Revenues were slightly higher for hauling semiperishables in 1969 than in 1954. However, revenues increased only 2.5 percent compared with an increase in volume of 23 percent.

The length of haul for most farm products carried by railroads has increased. Based on the latest available statistics from the ICC, most semiperishable farm products moved greater distances in 1966 than 1954. Of the 6 commodities with comparable data for the 2 years, 4 moved greater distances and 2 moved shorter distances. The average length of haul per ton of wheat was 334 miles in 1954 and 453 miles in 1966. Sorghum grain increased from 341 miles to 544 miles. Soybeans decreased from 189 to 173 miles and sugarbeets decreased from 76 to 72 miles.

The expanded use of larger equipment, such as the 100-ton capacity covered hopper car, and incentive rates for larger shipments caused a considerable increase in the average load per car for most semiperishable commodities. The average load for grains increased from 53 tons in 1954 to 72 tons in 1969. The other 5 semiperishable commodities increased from 34 tons per car to 46. Cotton increased from 19 tons per car to 23. These figures indicate that the higher density products, such as the grains, increased in tons per car more than low density products. One notable exception was tobacco, which increased from 15 tons per car to 22.

Table 8.--Railroad traffic volume of 10 semiperishable classes of farm products, selected years

Farm products	1954	1958	1962	1966	1969
			1,000 tons		
Wheat	33,750	38,081	36,171	45,444	34,785
Corn	19,036	21,934	29,264	32,407	27,109
Sugarbeets	8,581	8,992	10,895	10,079	11,191
Soybeans	5,612	7,612	9,685	10,864	11,041
Sorghum grain	3,362	10,724	9,430	14,785	7,115
Barley and rye	5,470	8,119	5,640	5,698	6,083
Cotton in bales	4,228	4,120	3,714	3,966	3,650
Oats	3,558	3,287	2,527	2,516	2,460
Dry ripe veg. seeds	780	831	979	782	801
Tobacco	721	534	589	553	330
Total	85,055	104,234	108,894	127,094	104,565
Total carload freight traffic	1,217,005	1,185,951	1,231,415	1,447,852	1,472,619
			Percent		
Semiperishable products as a percentage of total carload freight revenue	7.0	8.8	8.8	8.8	7.1

Table 9.--Railroad revenue from 10 semiperishable classes of farm products, selected years

Farm products	1954	1958	1962	1966	1969
			1,000 dollars		
Wheat	213,721	260,965	220,000	276,732	218,798
Corn	112,004	143,147	159,356	145,189	120,396
Cotton in bales	59,826	56,503	49,823	50,245	49,054
Sorgham grain	21,651	70,424	56,522	83,481	44,368
Barley and rye	33,144	62,610	38,577	42,629	44,355
Soybeans	28,171	37,302	34,860	39,214	40,363
Sugarbeets	12,352	13,043	16,189	16,186	21,304
Oats	23,120	23,951	15,290	15,091	15,001
Dry ripe veg. seeds	10,607	10,667	10,796	9,039	9,444
Tobacco	8,340	6,003	5,943	5,148	3,524
Total	552,936	684,615	607,356	682,954	566,607
Total carload freight revenue	7,890,288	8,257,195	8,285,280	9,679,324	10,801,141
			Percent		
Revenues from semiperishable products as a percentage of total carload freight revenue	7.0	8.3	7.3	7.1	5.2

On a percentage basis, only ripe vegetable seeds and sorghum grain had larger increases than tobacco. This may be attributed, in part, to the use of special purpose boxcars designed to haul a large number of hogsheads of tobacco per car.

Rail Traffic in Perishable Farm Products

Shipments of most highly perishable farm products declined sharply between 1954 and 1969 (table 10). The combined volume of 10 selected commodities declined by 40 percent. Livestock decreased from 4.63 million tons in 1954 to .95 million tons in 1968 or a decrease of 80 percent. Apples decreased by 48 percent and citrus by 33 percent. The only products showing gains were lettuce, 16 percent and onions, 11 percent.

Freight revenues from these products also declined, but not as much as tonnage. Revenues were 28 percent smaller in 1969 than in 1954 (table 11). Eight of the 10 classes of commodities had lower revenues. Livestock revenues declined by 76 percent, apples declined by 32 percent, and citrus by 30 percent. Revenues from onions increased 49 percent and lettuce by 27 percent. Some of the declines in carload traffic of perishable products may have been offset by increases in mixed loads in trailer-on-flatcars but no statistics are available on the type of commodities included in these shipments.

Perishable products tended to move greater distances over the 16-year period. Comparable data are available for only 3 of the commodities. Of these, potatoes increased from 1,153 miles per ton in 1954 to 1,357 miles per ton in 1966. Livestock increased from 750 miles per ton to 938 miles per ton, and citrus increased from 1,800 miles per ton to 2,036. These figures indicate that much of the volume lost to other modes consisted of shipments that move over shorter distances.

The average load per car for the 10 perishable farm products increased from 14 tons in 1954 to 23 tons in 1969. Melons and lettuce showed the greatest increase and apples and citrus the least increase. The increase in average load can be attributed to heavier loading of cars, and the increased use of larger mechanical refrigerated cars.

Competition for the Railroad

As indicated in table 6 and figure 1, railroads have done quite well in maintaining their competive position in the total movement of agricultural products, although they have lost considerable traffic in perishable commodities. Even the lowering of rates for some perishable commodities, such as livestock and citrus, has not prevented losses in this traffic. Since production, consumption, and exports of most agricultural products have increased, losses in volume of such perishable products as livestock and citrus by the railroads must have been captured by other modes or were shipped as processed farm products. For example, while livestock shipments by rail decreased by 80 percent from 1954 to 1969, shipments of processed meat and meat products by rail increased by 9 percent. Data from the U.S. Army Corps of Engineers indicate that barges moved considerable tonnage of grain in recent years. In 1968, barges moved in excess of 11 million tons of feed grains plus other commodities such as wheat and soybeans.

Total tonnage of grain moved by railroads showed considerable increases in the period from 1954 to 1969. This reflects increased grain production, off-farm sales and government shipments, and the adjustments of rail rates to meet truck and barge competition.

The average distance railroads haul grain increased from 325 miles per ton in 1954 to 429 miles per ton in 1966. This increase can be attributed to the loss of some short-haul traffic to motor trucks, shifts in the markets for feed grains from the areas of major production, and increased exports, requiring longer movements of grain to export points.

Three important factors contribute to the railroads' loss of perishable product traffic to motor trucks. First, the railroad advantage in rate-making is directly related to the distance that

Table 10.--Rail traffic volume of 10 perishable farm products, selected years

Farm products	1954	1958	1962	1966	1969
	1,000 tons				
Potatoes	3,936	3,419	3,375	3,548	2,981
Lettuce	968	848	915	1,074	1,123
Citrus	1,635	1,112	954	1,129	1,103
Livestock	4,626	3,067	2,194	1,334	950
Melons	733	477	444	457	589
Onions	326	249	253	305	362
Grapes	370	306	343	391	309
Tomatoes	287	171	261	280	281
Celery	333	298	285	309	274
Apples	467	460	222	315	245
Total	13,681	10,407	9,246	9,142	8,217
Total carload freight traffic	1,217,005	1,185,951	1,231,415	1,447,852	1,472,619
	Percent				
Perishable products as a percentage of total carload freight traffic	1.1	0.9	0.8	0.6	0.6

Table 11.--Railroad revenue from 10 classes of perishable farm products, selected years

Farm products	1954	1958	1962	1966	1969
	1,000 dollars				
Potatoes	78,544	79,221	68,472	70,846	64,237
Lettuce	39,826	40,980	42,676	46,007	50,775
Citrus	53,660	38,110	30,463	37,162	37,851
Melons	27,711	20,788	20,921	18,200	24,087
Livestock	86,401	70,990	50,171	29,201	21,129
Grapes	16,644	15,131	16,441	17,183	13,772
Onions	7,862	7,811	7,156	8,906	11,753
Celery	14,485	13,803	11,026	11,443	11,417
Apples	16,118	17,489	8,326	12,417	11,001
Tomatoes	12,213	9,800	10,406	9,469	10,142
Total	353,464	314,123	266,058	260,834	256,164
Total carload freight revenue	7,890,288	8,257,195	8,285,280	9,679,324	10,801,141
	Percent				
Revenues from perishables as a percentage of total carload freight revenue	4.5	3.8	3.2	2.7	2.4

products move. Therefore, adjustments in long-haul rates to meet competition cannot be matched by adjustments in short-haul rates.

Second, movement of most agricultural products is exempt from economic regulation by the Interstate Commerce Commission when shipped by motor truck. The exemption applies not only to truckers who haul agricultural products exclusively but also to the common, contract, and private carriers. This permits a large amount of freedom for truckers in contracting for agricultural shipments. Also, agricultural products are often available for a back-haul and the trucker can be persuaded to haul them at a low rate rather than return empty.

The third factor is the service advantages that motor trucks offer. Trucks can pick up and deliver products at a number of points for the same load. Firms without rail connection at their facilities can ship and receive products directly by truck, eliminating double handling. In many cases truck transportation is faster than movement by rail.